



N-terminal Pro-brain Natriuretic Peptide Test Kit (FIA) Package Insert

REF	VID14-03-011	English
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INTENDED USE

VivaDiag N-terminal Pro-brain Natriuretic Peptide Test Kit (FIA) is a fluorescence immunoassay (FIA) for the quantitative determination of N-terminal pro-brain natriuretic peptide in human whole blood, serum, or plasma. N-terminal pro-brain natriuretic peptide (NT-proBNP) is useful as an aid in the diagnosis of persons suspected of having congestive heart failure.^[1]

For *in vitro* diagnostic use only.

For professional use only.

INTRODUCTION

The production of NT-proBNP is mainly released by ventricular myocytes, released in response to myocardial stress and filling pressure, and is involved in maintaining the steady state of the intravascular volume. After stimulating cardiomyocytes, natriuretic peptides are produced in the form of prohormone (proBNP) and are cut into two fragments, which are secreted into the bloodstream as active BNP of 32 amino acids and N-terminal fragments of 76 amino acids, called NT-proBNP.^[2] The NT-proBNP immunoassay is widely used and is now recognized as a useful marker, and has a high diagnostic accuracy as a diagnostic tool for the occurrence and severity of heart failure (HF) in clinical practice and cardiovascular research. Therefore, the measurement of NT-proBNP in human blood is not only helpful in the diagnosis of heart disease, but also in evaluating patients with suspected heart failure and assessing the severity of the disease.^[3]

PRINCIPLE

VivaDiag N-terminal Pro-brain Natriuretic Peptide Test Kit (FIA) is based on fluorescence immunoassay technology, specifically the sandwich immunodetection method. When the sample is added into sample well of the test device, NT-proBNP binds to the fluorescence-labeled antibody to form immune complexes. Then the immune complexes migrate on the membrane, and bind specially to antibody coated on the test line. The intensity of

fluorescence signal reflects the amount of NT-proBNP in the sample, which then is processed by VivaDiag POCT Analyzer to show the NT-proBNP concentration.

COMPONENT

VivaDiag N-terminal Pro-brain Natriuretic Peptide Test Kit (FIA) contains the 'Test Device (packaged in pouch with desiccant)', 'ID Card', 'Buffer Tube (prefilled with buffer)' and 'Package Insert'.

- Test Device: It is composed of glass fiber, nitrocellulose membrane, plastic backer, absorbent paper and plastic cassette.
- ID Card: Calibration information.
- Buffer Tube: Sample diluent.
- Package Insert: Instruction for use.

MATERIALS SUPPLIED

Each VivaDiag N-terminal Pro-brain Natriuretic Peptide Test Kit (FIA) contains:

- 25 Test Devices
- ID Card
- 25 Buffer Tubes
- 1 Package Insert

MATERIALS REQUIRED BUT NOT SUPPLIED

- VivaDiag POCT Analyzer
- VivaDiag N-terminal Pro-brain Natriuretic Peptide Control Solution (FIA)
- Timer
- Pipettes with pipette tips for 75 µL

STORAGE AND STABILITY

- Store the test kit in a cool, dry place between 2 ~ 30°C. Keep away from light. Exposure to temperature and/or humidity outside the specified conditions may cause inaccurate results.
- Do not freeze.
- Do not open the pouch until ready to perform the assay.
- Once the pouch is opened, the test device should be used in 1 hour.
- All expiration dates are printed in Year-Month-Day format. Example: 2026-06-18 indicates June 18, 2026.

WARNINGS AND PRECAUTIONS

- For *in vitro* diagnostic use only.
- For professional use only. Testing should be applied by well-trained healthcare professionals, and conducted in central laboratories, GP offices, clinics, pharmacy and medical

examination centers etc.

- Please follow the Package Insert when testing.
- The Test Device should remain sealed in its original pouch until just before use. Do not use the Test Device, if pouch is damaged or has already been opened.
- Do not reuse the Test Device and do not use your test kits beyond the expiration date. Biological materials used beyond their expiry date can become unstable and fail.
- It is recommended to use an anticoagulant blood collection tube (heparin or citrate). Other anticoagulants have not been evaluated in VivaDiag N-terminal Pro-brain Natriuretic Peptide Test Kit (FIA) and thus should not be used.
- Use the test kits at temperatures between 18 ~ 25°C.
- Use the test kits between 10 ~ 90% humidity.
- Do not use the Test Device in extremely temperature. If the Test Device has been stored refrigerated, bring to the ambient temperature (18 ~ 25°C) prior to testing and avoid moisture absorption.
- Keep the test kit away from direct sunlight.
- All parts of kit are considered biohazardous and can potentially transmit infectious diseases from blood borne pathogens, even after you have performed cleaning and disinfection. Follow proper precautions and all local regulations when disposing of the used test kits and other accessories.
- Do not interchange the test components between different lots or use the test components after the expiration date, either of which might yield incorrect test result(s).
- Please contact your local distributor to solve problems timely if you have any questions or need help.
- VivaDiag N-terminal Pro-brain Natriuretic Peptide Test Kit (FIA) will provide accurate and reliable results subject to the below conditions.
 - a) VivaDiag N-terminal Pro-brain Natriuretic Peptide Test Kit (FIA) should be used combined with VivaDiag POCT Analyzer.
 - b) Whole blood or plasma samples should be collected with a suitable anticoagulant blood collection tube (heparin or citrate is recommended).

SAMPLE COLLECTION AND PROCESSING

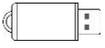
The sample type for VivaDiag N-terminal Pro-brain Natriuretic Peptide Test Kit (FIA) is human whole blood/serum/plasma.

- For serum sample, separate the serum from the clot as soon as possible to avoid hemolysis.

- For whole blood or plasma sample, collect the blood with a suitable anticoagulant blood collection tube (heparin or citrate is recommended).
- The serum/plasma can be stored at 2 ~ 8°C for 7 days, or frozen at -20°C for 6 months; the whole blood can be stored at 2 ~ 8°C for 2 days, and avoid frozen.
- Once the serum/plasma sample was frozen, it should be thawed only once. As a repeated freeze-thaw cycle may affect the test result, do not refreeze previously frozen samples.

PREPARE FOR TEST

- Turn on the Analyzer for at least 5 minutes before testing.
- If the test kit has been stored in a refrigerator, place it on a clean and flat surface at 18 ~ 25°C for at least 30 minutes before testing.
- Check the contents of VivaDiag N-terminal Pro-brain Natriuretic Peptide Test Kit (FIA): 'Test Device (packaged in pouch with desiccant)', 'ID Card', 'Buffer Tube (prefilled with buffer)', and 'Package Insert'.
- Check the label information of the ID Card to make sure that the ID Card matches the Test Device.
- Select the ID card that matches the current Analyzer being tested, according to the User's Manual of VivaDiag POCT Analyzer.

ID Card Type	
Code Chip 	USB Flash Drive 

TEST PROCEDURE

Input Information

- Insert the ID Card into the port on the Analyzer
- When the information is read successfully, the test item will change to "NT-proBNP".
- Select the correct sample type.

Note: Please refer to the User's Manual of VivaDiag POCT Analyzer for complete information and operating instructions.

Run Test (Standard Test Model)

- Take the Test Device out of the foil pouch and place it on a clean, dust-free and flat surface.
- Pipette **75 µL** human whole blood/serum/plasma to the Buffer Tube.
- Gently invert and mix the solution well. Avoid bubbles. Use the

mixed solution within one hour.

- Pipette **75 µL** mixed solution from the Buffer Tube to the sample well of the Test Device. Avoid bubbles.
- Insert the Test Device into the holder of VivaDiag POCT Analyzer. Ensure proper orientation of the Test Device before pushing it into the holder. An arrow has been marked on the Test Device especially for this purpose.
- Click the button to start the test. The Analyzer will scan the sample-loaded Test Device after **15 minutes**.
- Read the test result on the display screen of VivaDiag POCT Analyzer, or print it by clicking the "Print" button on the display screen.

Run Test (Quick Test Model)

- Take the Test Device out of the foil pouch and place it on a clean, dust-free and flat surface.
- Pipette **75 µL** human whole blood/serum/plasma to the Buffer Tube.
- Gently invert and mix the solution well. Avoid bubbles. Use the mixed solution within one hour.
- Pipette **75 µL** mixed solution from the Buffer Tube to the sample well of the Test Device. Avoid bubbles.
- Place the sample-loaded Test Device on a clean, dust-free and flat surface and reaction for **15 minutes**.
- Insert the Test Device into the holder of VivaDiag POCT Analyzer. Ensure proper orientation of the Test Device before pushing it into the holder. An arrow has been marked on the Test Device especially for this purpose.
- Click the button to start the test. The Analyzer will scan the sample-loaded Test Device in seconds.
- Read the test result on the display screen of VivaDiag POCT Analyzer, or print it by clicking the "Print" button on the display screen.

INTERPRETATION OF TEST RESULT

The Analyzer calculates the NT-proBNP test result automatically and displays "NT-proBNP" concentration on the screen.

Reference Interval:

NT-proBNP: ≤300 pg/mL

Parameter	Result	Suggestion
NT-proBNP	≤300 pg/mL	Normal levels
	>300 pg/mL	Indicating the risk of heart failure

Note: Each laboratory should establish a reference interval that

is representative of the population to be evaluated. For diagnostic purposes, the results should always be assessed with the patient's medical history, clinical examinations and other findings.

QUALITY CONTROL

- Users should follow government guidelines and/or accreditation requirements for quality control.
- Quality control tests are a part of the good testing practice to confirm the expected results and validity of the assay and should be performed at regular intervals.
- Quality control tests should be performed immediately after opening a new test lot to ensure the test performance is not altered.
- Quality control tests should also be performed if the result and the symptoms are not consistent or if there are doubts about their accuracy.
- Control materials are not provided with VivaDiag N-terminal Pro-brain Natriuretic Peptide Test Kit (FIA). For more information regarding obtaining the control materials, contact with your local distributor for assistance.

Note: Please refer to the Package Insert of VivaDiag N-terminal Pro-brain Natriuretic Peptide Control Solution (FIA) for detailed information.

LIMITATIONS OF THE PROCEDURE

- The performance of this product has been established for human whole blood/serum/plasma only. Other specimen types have not been evaluated.
- The test may yield false negative result. The non-responsiveness of the antigen to the antibodies is most common where the epitope is masked by some unknown components, so as not to be detected or captured by the antibodies. The instability or degradation of the antigen with time and/or temperature may cause the false negative as it makes antigen unrecognizable by the antibodies.
- There is a possibility that substances and/or factors may interfere with the test and cause false results. Technical or procedural errors can also contribute to erroneous results.
- The false positive results may be caused by the cross-reactions and/or other non-specific adhesion of certain sample components to the capture/detector antibodies.
- Test results must always be evaluated with other data available to the physician. Any clinical diagnosis based on the test result must be supported by a comprehensive judgment of the

concerned physician including clinical symptoms and other relevant test results. The test result cannot be used for diagnosis. If the result is not matched the clinical evaluation, please do more testing.

PERFORMANCE CHARACTERISTICS

· Measuring Range and Detection Capability

Measuring Range: 18 ~ 35000 pg/mL

Limit of Blank (LoB): 16.06 pg/mL

Limit of Detection (LoD): 17.63 pg/mL

· Precision

Repeatability: On the one analyzer, the specified 3 levels of samples were tested for one day, measured 20 times a day.

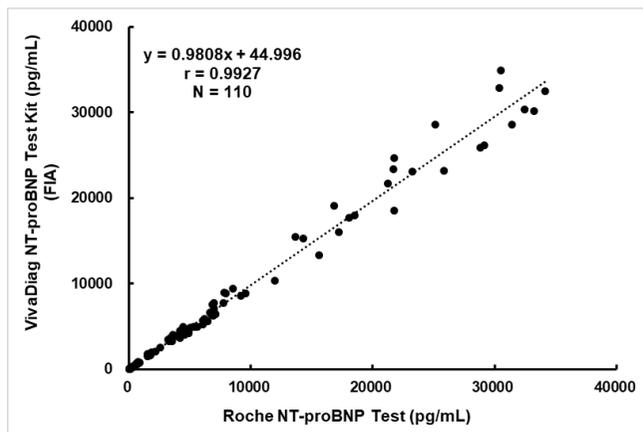
Reproducibility: In three laboratories, on the 3 analyzers, the specified 3 levels of samples were tested for 5 days by 3 operators, measured 5 times a day.

Sample	NT-proBNP (pg/mL)	Repeatability		Reproducibility	
		SD	CV (%)	SD	CV
1	100	10.66	10.84	8.43	8.37
2	1600	134.03	8.46	191.30	11.95
3	25000	2359.80	9.28	2525.26	10.12

· Accuracy

A comparison study using 110 human serum samples, demonstrated good correlation with a commercially available kit. Comparison between VivaDiag N-terminal Pro-brain Natriuretic Peptide Test Kit (FIA) and Roche NT-proBNP Test is summarized in the following table and figure:

Method	Number	Intercept	Slope	Correlation Coefficient
Ordinary Linear Regression	110	44.996	0.9808	0.9927



· Specificity

The following substances do not interfere with the test results at the indicated concentrations:

Interfering Substance	Concentration
Bilirubin	5 mg/L
Triglyceride	50 mg/L
Hemoglobin	10 g/L
Rheumatoid Factors	200 IU/mL

LITERATURE REFERENCES

- [1] M.A. Mamas, M. Sperrin, M.C. Watson, A. Coutts, K. Wilde, C. Burton, U.T. Kadam, C.S. Kwok, A.B. Clark, P. Murchie, I. Buchan, P.C. Hannaford, P.K. Myint, Do patients have worse outcomes in heart failure than in cancer? A primary care-based cohort study with 10-year follow-up in Scotland, Eur. J. Heart Fail. 19 (9) (2017)1095–1104.
- [2] P. Biagi, G. Gussoni, I. Iori, R. Nardi, G. Mathieu, A. Mazzone, D. Panuccio, G. Scanelli, C. Cicatello, C. Rinollo, M. Muriago, D. Galasso, E. Bonizzoni, G. Vescovo, CONFINE Study Group, Clinical profile and predictors of in-hospital outcome in patients with heart failure: the FADOI "CONFINE" Study, Int. J. Cardiol. 152 (1) (2011) 88–94.
- [3] Platz E, Jhund PS, Campbell RT, McMurray JJ. Assessment and prevalence of pulmonary oedema in contemporary acute heart failure trials: a systematic review. Eur J Heart Fail. 2015; 17: 906–916. [PMC free article] [PubMed] [Google Scholar]

INDEX OF SYMBOLS

	Consult instructions for use or consult electronic instructions for use
	Use-by date
	Contains sufficient for <n> tests
	In vitro diagnostic medical device
	Batch code
	Catalogue number
	Manufacturer
	Date of manufacture
	Temperature limit
	Do not re-use
	Authorized representative in the European Community/European Union

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